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### **A Meta-method analysis of time assumptions in competitive dynamics research**

**Abstract:** The authors run a meta-method analysis and content analyze 74 empirical articles citing ten seminal articles in competitive actions research to determine how studies define and take time into account in their research design. Different time definitions will be carefully exposed and linked to research published in the field. Weaknesses will be detailed and suggestions for addressing these problems will be provided.

**Keywords:** competitive dynamics; time; drivers of actions; research methods; meta-method.

### **PURPOSE OF THE PAPER**

Time is a central element for competitive dynamics research. In strategy literature, the conception of competition used to focus on the structure of the market (Baum, 1996), where competition is conceptualized as a flux of firms' competitive actions and responses (Smith *et al.*, 1992) undertaken to achieve competitive advantage (Porter, 1980). The breakthrough this stream of research operated in considering competition as dynamic is, by definition, time-related. Many empirical studies have been conducted since the beginning of the 1990s on a large variety of samples allowing a better comprehension of competitive behavior and rivalry (Smith *et al.*, 2001; Ketchen *et al.*, 2004; Hutzschenreuter & Grove, 2009). Nevertheless, little attention has been paid to the way time is or could be defined, measured or taken into account in research. Following several calls for incorporating temporal issue in organization and

strategy research (Mosakowki & Earley, 2000; Ancona *et al.*, 2001), the goal of this paper is to fill this gap.

We conducted a meta-method defined as an “*analysis and interpretation of methodological applications across multiple qualitative reports*” (Finfgeld, 2003) on 74 high-impact empirical studies, published between 1990 and 2010, were identified and analyzed using a specific and multi-dimensional coding scheme built on prior investigations of temporal dimensions in organization and strategy research (Mosakowski, 2000; Ancona, Okhuysen & Perlow, 2001; Mitchell *et al.*, 2001). Comparing our findings with temporal research opportunities in organization and strategy fields, we will suggest a conceptual and methodological research agenda which may help a better understanding of the drivers of competitive behavior.

## THEORETICAL BACKGROUND

### Competitive dynamics research

Competitive dynamics research focuses on *the conduct of the firm* (Baum, 1996). Competitive action is viewed as a vehicle for the entrepreneurial discovery highlighted by the Austrian School of Economy (Smith *et al.*, 1992; Smith, Ferrier & Ndofo, 2001). Following the Austrian view of the market (Smith *et al.*, 1992), competition is a process constituted of the successive discoveries of firms.

This stream of research has rapidly developed in the strategic management field since the beginning of the 1990s. It has made significant advances in highlighting the interdependence of competitors and explaining the antecedents of their behavior (Smith *et al.*, 2001). Taking support on the awareness-motivation-capabilities perspective (Chen, 1996), scholars have in particular identified the attributes of the firms, their competitive individual actions or repertoires that have strong influence on rivalry and on performance. As for the characteristics of the competitors, they have primarily focused on structural or objective considerations and variables (Chen, 2007; Livengood, 2010; Narayanan, 2011).

In this stream, strategy is defined as a “*series of races against the clock*” (Ferrier, 2001). Time is therefore of central importance and is no longer considered as an “*idealized long term*” (Smith *et al.*, 1992). The timing of competitive actions or responses (Ferrier, Smith, & Grimm, 1999; Smith, Grimm, & Gannon, 1992) and the *duration* of an uninterrupted series of actions have been shown to directly impact the performance of the

firms (Ferrier, 2001). Managers are therefore invited to focus more on current market events than on past one.

### **Literature on time in organizations and strategy research**

For a long time, time has been viewed as a fundamental topic in organization or strategy literature. Nevertheless, it has not really been considered as an ontologically central construct (George & Jones, 2000) and little attention has been paid in the literature (Mosakowski & Earley, 2000; Goodman *et al.*, 2001).

Time can be either explicit or implicit. It is explicit when the dependent and/or independent variables capture time (Mitchell & James, 2001). It is implicit when they do not (Mitchell & James, 2001) but their relationship has a temporal dimension, like a causal relationship. The lag between the independent and dependent variables, their duration or stability are critical time-issues (Mitchell & James, 2001).

When time is explicit, in the so-called time-focused research (Ancona *et al.*, 2001), its nature may vary. It is real when it has a direct importance and represents a *fundamental "category"* (Mosakowski & Earley, 2000). That is typically the case when competitive dynamics scholars study the impact of the speed of responses on performance, as mentioned earlier. Time is epiphenomenal when existing *only in relation to events, objects, space* (Mosakowski & Earley, 2000), for example through variables such as experience, organizational or team tenure. The nature of time is one of the several dimensions of time identified in the literature (George, 2000; Mosakowski, 2000; Ancona, Okhuysen & Perlow, 2001), drawing from anthropology, phenomenology, psychology or sociology fields.

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Insert Table 1 about here  
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Introducing a plural view of time from those fields offer potential outcomes of research in organization studies (Ancona, Goodman, Laurence, 2001, Crosmann, 2005), in particular in strategy and management research (Mosakowski, 2000). Issues are both ontological (Gorges & Jones, 2000), conceptual, and methodological (Mitchell & James, 2001). Based on this review of time assumptions in strategy research, the main definitions of time dimensions are presented in Table 1 and helped us to build our coding grid, presented below.

## Research gap

Several scholars have already reviewed accomplishments in competitive dynamics research (Smith, 1997; Smith *et al.*, 2001; Ketchen *et al.*, 2004; Hutzschenreuter & Grove, 2009) and proposed future directions (Smith *et al.*, 2001; Ketchen *et al.*, 2004; Hutzschenreuter & Grove, 2009). But little attention has been paid to issues on time. The purpose of this article is to analyze time conception, specification and dimensions in competitive action research through a meta-method analysis and to propose a temporal research agenda in this field.

## APPROACH TAKEN

### Method

With a metastudy analysis, defined as an “*inductive research approach involving the analysis and interpretation of theory, methods, and research findings across studies, and the synthesis of this work to formulate new interpretations*” (Finfgeld, 2003), we applied a meta-method (Zhao, 1991) and codified different time natures, experiences, flows, structures and orientations. This approach allows us to analyze and interpret conceptual and methodological issues in the field.

### Articles collection

There is no consensus regarding the best source selection process for metastudies (Finfgeld, 2003). Prior reviews of competitive strategy and dynamics literature (Hoskisson, 1999; Smith *et al.*, 2001; Stephan, 2003; Ketchen *et al.* 2004; Nokelainen, 2008) have identified a set of ten seminal papers (Table 2) in terms of theoretical or methodological contributions (*to be developed*).

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Insert Table 2 about here  
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To be included in our analysis, an article must have cited at least one of the ten seminal papers and been published between 1990 and 2010. Furthermore, we limited our review to articles published in top influential and ranking academic journal because the rigor of their review process typically indicates scientific quality of the research (Podsakoff,

MacKenzie, Bachrach, & Podsakoff, 2005). We restricted our sample to empirical research articles dealing explicitly with competition and being consistent with the theoretical foundations of competitive dynamics research (Porter, 1980; Barney, 1981; Ketchen, 2004). The final sample is composed of 74 articles published in the nine following journals: *Academy of Management Journal*, *Administrative Science Quarterly*, *Group and Organizational Management*, *Journal of Business Research*, *Journal of International Business Studies*, *Journal of Management*, *Management Science*, *Organization Studies*, *Strategic Management Journal*.

### **Coding process**

The dataset was doubled-coded using a coding scheme described in Table 3 (*to be refined and developed*).

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Insert Table 3 about here  
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## **MAIN FINDINGS AND CONTRIBUTIONS**

*Sample.* Among our 74 articles, 23 articles (30%) were published prior to 2000, 53 (70%) between 2000 and 2010. In terms of journals, 20 were published in the *Academy of Management Journal* (26%), 22 in *Strategic Management Journal* (29%), 34 (45%) shared between the seven others journals listed above. 19 articles (25%) cited more than five seminal articles.

*Findings.* From the coding grid presented in Table 3, several main findings will be exposed. First, we will define how time is defined and taken into account in the question of research and hypotheses (explicitly or implicitly), how time is measured (objectively, subjectively), structured (discretely, continuously, epochal), what nature of time is observed (real or epiphenomenal). Then, we will pay attention to how, despite longitudinal data, time is often very implicitly taken into account only through panel empirical methods, implying only a dynamic approach or through lag effects defining an implicit causality, but without specifying any specific time assumptions. These results will be crossed with the main area of research: action-reaction dyad (Smith *et al.*, 1991; Chen, Smith, & Grimm, 1992; Baum & Korn, 1996); competitive activity (Miller & Chen, 1994, 1996; Young, Smith, & Grimm,

1996; Ferrier, Smith, & Grimm, 1999) or multimarket competition (Karnani & Wernerfelt, 1985; Chen, 1996; Gimeno & Woo, 1996). The primary results highlight both conceptual and methodological gaps in the literature, as competitive dynamics research seems to take into account a relatively narrow conception of time. Moreover, it might not explore in-depth the temporal complexity of casual relationship.

*Contributions.* The review above might suggest interesting contributions and room for future theoretical and methodological improvements on the field. 1) If time is a central element for competitive dynamics research, it is commonly implicitly defined or measured, possibly never clearly mentioned in the question of research nor in the hypotheses. 2) If most studies have a longitudinal sample, few articles justify the unit of time. Few explain what trends, speed of changes or duration of actions they capture through their longitudinal methods. 3) If most of articles use sophisticated panel data analyses, it appears more as a technical and econometric issue (to insure non biased estimators) as a time issue or thoughtful longitudinal approach. 4) We observed that articles mainly focus on one single nature or experience of time, namely “real” and “objective” as defined by Mosakowsky (2000). A few research integrate the perceived dimension of time (based on the experience of TMTs).

This study contributes to the literature in highlighting a theme largely under emphasized in the competitive action research. It proposes a new lens through which to view actions and draw research designs in the field. The results of the meta-study will help to suggest some guidelines complementary to the prior methodological review of Smith *et al.* (2001), Ketchen *et al.* (2004) and Hutzschenreuter & Grove (2009). They will allow also a research agenda as regards some of the key components of the competitive dynamics model (Smith *et al.*, 1992), contributing to recent calls for a greater focus on psychological and cognitive theories (Ferrier *et al.*, 2001, Chen 2007; Livengood, 2010) in the field.

## SELECTIVE REFERENCES

*References of the ten seminal articles are presented in Table 2.*

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**TABLE 1****Definition of Time Dimensions**

<b>Dimensions of time</b>	<b>Coding characteristics</b>	<b>Definition</b>
Nature of time	Real	Time is coded as a real phenomenon when considered as an important strategic outcome variable
	Epiphenomenal	Time is coded epiphenomenal when it is taken into account “only in relation to events, objects, space”.
Experience of time	Objective	Time is based on some external metric
	Subjective	Time is apprehended through its human interpretation
Time flow	Novel time flow	“Time flow is perceived to advance with novelty and little repetition of events” that is “a future different to the past”
	Cyclical time flow	“Time flow is perceived to advance cyclically with repetitive events”
	Punctuated time flow	“Time flow is perceived to advance irregularly with repetitive events punctuated by novel ones”
Time structure	Discrete	“The structure of time is perceived to consist of discrete temporal units of measurable and equal duration (discrete)”
	Continuous	“A continuous flow that cannot be broken into units but can only be identified with events (continuous)”
	Epochal	“A discrete temporal units, the length of which is perceived to vary depending on subjective experience (epochal)”
Times orientation	Past – Present	“This refers to a backward logic that allocates a firm's returns to resources possessed in the past by assuming that properly valued assets generate normal returns. This past orientation of the resource-based view is also reflected in path-dependency arguments”
	Present - Future	“The traditional SWOT analyzes a firm's strengths and weaknesses today given its future opportunities and threats.”
Time as implicit causality	Research design	How to define the model (direct, moderator, mediator effects, use of control variables)
	Timing of measurement	How to define the lag between measurements to capture the exact length of the causal lag
	Frequency of measurement	How often to measure to capture different types of changes over time
	Stability	Changes in the assessment of a variable over time

*Inspired by Mosakowki & Earley (2000) and Mitchell & James (2001)*

**TABLE 2****Ten Seminal Contributions in Competitive Action Research**

#	Authors	Year	Journal	Title	Research area	Justification
1	Karnani & Wernerfelt	1985	SMJ	Multiple Point Competition	Multimarket Competition	Hoskisson (1999) Stephan (2003)
2	Smith, Grimm, Gannon, & Chen	1991	AMJ	Organizational Information-Processing, Competitive Responses, and Performance in the United-States Domestic Airline Industry	Action-Reaction Dyad	Hoskisson (1999) Smith et al. (2001) Nokelainen (2008)
3	Chen, Smith, & Grimm	1992	MSC	Action Characteristics as Predictors of Competitive Responses	Action-Reaction Dyad	Smith et al. (2001) Nokelainen (2008)
4	Miller & Chen	1994	ASQ	Sources and Consequences of Competitive Inertia - a Study of the United-States Airline Industry	Competitive Activity	Smith et al. (2001)
5	Baum & Korn	1996	AMJ	Competitive Dynamics of Interfirm Rivalry	Action-Reaction Dyad	Hoskisson (1999) Smith et al. (2001) Stephan (2003)
6	Chen	1996	AMR	Competitor Analysis and Interfirm Rivalry: Toward a Theoretical Integration	Multimarket Competition	Hoskisson (1999) Smith et al. (2001) Nokelainen (2008)
7	Gimeno & Woo	1996	OS	Hypercompetition in a Multimarket Environment: the Role of Strategic Similarity and Multimarket Contact in Competitive De-Escalation	Multimarket Competition	Hoskisson (1999) Smith et al. (2001) Stephan (2003)
8	Miller & Chen	1996	SMJ	The Simplicity of Competitive Repertoires: an Empirical Analysis	Competitive Activity	Smith et al. (2001) Nokelainen (2008)
9	Young, Smith, & Grimm	1996	OS	"Austrian" and Industrial Organization Perspectives on Firm-Level Competitive Activity and Performance	Competitive Activity	Smith et al. (2001) Nokelainen (2008)
10	Ferrier, Smith, & Grimm	1999	AMJ	The Role of Competitive Action in Market Share Erosion and Industry Dethronement: a Study of Industry Leaders and Challengers	Competitive Activity	Smith et al. (2001) Nokelainen (2008)

*AMJ: Academy of Management Journal, AMR: Academy of Management Review, MSC: Management Science, OS: Organization Science, SMJ: Strategic Management Journal.*

TABLE 3

**Coding Grid of the Meta-method Analysis (*to be developed*)**

Categories	Subcategories	Coding value	Coding characteristics
Article	Date of publication		Comprised between 1991 and 2011
	Journal		Nine journals
	Link with seminal articles		Seminal articles cited in the references
	Link with competitive dynamics research		Number of seminal articles cited in the references
Competition	Area of research	Individual action	Each individual competitive action is observed
		Competitive activity	Competitive behavior is observed taking into account the whole set of actions of a firm in a finite period
		Multimarket competition	Firms compete in two or more product categories or markets
	Focus	Rivalry	Research focuses on the interaction between firms
		Competitive behavior	Research focuses on the antecedents or consequences of competitive behavior
Method	Design (1)	Pure qualitative	Tashakkori & Teddlie's typology (1998)
		Pure quantitative	Tashakkori & Teddlie's typology (1998)
		Mixed	Tashakkori & Teddlie (1998) and Greene, Caracelli & Graham (1989) typologies
	Design (2)	Longitudinal	
		Cross sectional	
	Time coverage	Years Window	
Time-focus	Hypothesis	Causal effect No causal effect	
	Variables	Imply a measure of time No time-oriented	
	Time area	Conceptions of time Activities to time Actors relating to time	
Time dimensions	Time Nature	Real Epiphenomenal	
	Experience of time	Objective Subjective	
	Time structure	Discrete Continuous	
		Epochal	
Measures	Variable stability		
	Time lag (causal effects)		

*Inspired by Mosakowski & Earley (2000), Ancona et al. (2001), Mitchell & James (2001).*